

Overview and Treatment of Bath Salts Intoxication and Opioid Withdrawal

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Learning Objectives

- Overview and treatment of bath salts intoxication
- Overview and treatment of opioid withdrawal



Case Presentation:

- “Mr. B” is a 40-year-old man with no past psychiatric history, brought to the emergency room by police and admitted to inpatient psychiatry unit due to his recent paranoid behavior and concerns he would harm others.
- Mr. B’s wife reported to police that Mr. B had been acting bizarrely and recently purchased a gun with the plan to shoot neighborhood children who he believed were trespassers.

Case Presentation

- He had a one-month history of increased paranoia, decreased sleep, high energy, self-mutilation (pulling out his body hair), increased sex drive, increased spending, and increased goal directed activity. He reported a thirty pound weight loss and reflux-like abdominal pain.

Case Presentation

- He confirmed to purchasing a 12-gauge shotgun, alleging trespassers on his property were “taunting” him and wanted to kill him. He reported the intruders wore camouflage clothing and clown make-up. He had also recently bought a video camera attempting to film those he claimed were trying to harm him, created “booby traps,” and called 911 multiple times reporting trespassers.

Case Presentation

- Mr. B admitted to smoking marijuana for fifteen years with a frequency of approximately three times a week. Mr. B denied a history of developing tolerance or withdrawal symptoms from marijuana usage.
- Mr. B denied history of other illicit drug usage. Also, he denied history of significant alcohol usage.

Case Presentation

- What was causing Mr. B's new onset psychotic symptoms with the potential for violent behavior?

Case Presentation

- Answer: Bath salts!
- Mr. B later admitted to using bath salts on two occasions approximately one month prior to admission. Mr. B reported he obtained bath salts from a co-worker and through the internet.

What are Bath Salts?

- Synthetic derivatives of cathinone (stimulant), a naturally occurring beta-ketone amphetamine analogue found in Khat plant (*Catha edulis*)



Watterson LR, Nemirovsky N, Sewalia K, Grabenauer M, Thomas BF, Manusich JA, Wegner S, Olive MF. Potent rewarding and reinforcing effects of synthetic cathinone 3,4 methylenedioxypyrovalerone(MDPV). *Addiction Biology* 2013; DOI: 10.1111/J.1369-16000.00474x.

Kyle PB, Iverson RB, Spencer L. Illicit Bath Salts: Not for Bathing. *J Miss State Med Assoc* 2011; 52(12):375-377

What are Bath Salts?

- Cathinones most commonly in bath salts:
 - 4-methylmethcathinone (Mephedrone)
 - 3,4-methylenedioxypropylone (MDPV)
- Other cathinones: methylone

Fass JA, Fass AD, Garcia AS. Synthetic Cathinones(Bath Salts): Legal Status and Patterns of Abuse. The Annals of Pharmacotherapy 2012; 46:436-441

Gershman JA, Fass AD. Synthetic Cathinones("Bath Salts") Legal and Healthcare Challenges. P &T 2012; 37(10):571-572, 595.



- United States: MDPV most commonly detected substance in bath salts
- MDPV functions as norepinephrine and dopamine reuptake inhibitor in CNS
- Related to hallucinogenic substances such as 3, 4 methylenedioxymethamphetamine (MDMA or Ecstasy)

Murray BL, Murphy CM, Beuhler MC. Death following recreational use of designer drug "Bath Salts" containing 3,4-methylenedioxypropylvalerone (MDPV). *J Med Toxicol* 2012; doi 10.1007/S13181-011-0196-9

Coppola M, Mondola R. 3,4-Methylenedioxypropylvalerone (MDPV): Chemistry, pharmacology and toxicology of a new designer drug of abuse marketed online. *Toxicology Letters* 2012;208(1) 5:12-15

Ross EA, Watson M, Goldberger B. "Bath Salts Intoxication." *The New England Journal of Medicine* 2011; 365(10):967-968.

Bath Salts: Desired Effects

- Euphoria
- Sexual stimulation
- Empathic mood
- Increased energy
- Visual hallucinations
- Time distortion
- Excessive talking
- Greater mental focus

Bath Salts: Routes of Administration

Bath Salts

- Nasal insufflation most common
 - “Keying”: placing a key into powdered salts then insufflating off the key
- Other routes: Oral ingestion, injection, smoking, sublingual and rectal
 - “Bombing”: wrapped in cigarette paper and ingested

Prosser JM, Nelson LS. The Toxicology of Bath Salts: A Review of Synthetic Cathinones. *Journal Medical toxicology* 2012; 8(1): 33-42

Lajoie TM, Rich A. “Bath Salts”: A new drug epidemic-Case Report. *The American Journal on addictions* 2012; 21:572-573.

Bath Salts: Duration of Effects

- Variable due to
 - Administration routes
 - Chemical heterogeneity
- With oral ingestion
 - Peak high at 1.5 hours
 - Lasting effects for 3-4 hours followed by a crash
 - Entire experience lasts 6-8 hours

Ross EA, Watson M, Goldberger B. "Bath Salts Intoxication." *The New England Journal of Medicine* 2011; 365(10):967-968.

Bath Salts: Adverse Psychological Effects

- **Mood:** depression, dysphoria, euphoria, anxiety
- **Thought:** suicidal ideation, homicidal ideation, intensification of sensory experiences, paranoid delusions, auditory/ visual/ tactile hallucinations,
 - Psychotic symptoms in 40% of cases where bath salt users presented to US emergency departments
- **Behavior:** insomnia, increased energy, agitation, anorexia, catatonia, panic attacks, self-mutilation, self-destructive behavior, violent behavior

Bath Salts: Adverse Physical Effects

- **Sympathomimetic Toxidrome:** tachycardia, HTN, diaphoresis, hyperthermia, agitation and combativeness; very common!

Citation for Slides 16-19:

Winder GS, Stern N, Hosanagar A. Are "Bath Salts" the next generation of stimulant abuse? *Journal of Substance abuse treatment* 2013; 44: 42-45.

Murphy CM, Duloney AR, Beuhler MC, Kacinko S. "Bath Salts" and "Plant Food" products: the experience of one regional US poison center. *J Med Toxicol* 2013; 9: 42-48.

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Joksovic P, Mellos N, Wattum JV. "Bath Salts-Induced Psychosis and Serotonin Toxicity. *J Clin Psychiatry* 2012; 73(8): 1125

Bath Salts:

Adverse Physical Effects

- **CV:** tachycardia, vasoconstriction, hyperthermia, diaphoresis, chest pain, hypertension, palpitations, arrhythmias, myocardial infarction, myocarditis, cardiac arrest
- **Pulmonary:** Respiratory distress
- **CNS:** headache, confusion, drowsiness, dizziness, tremors, myoclonus, hyperreflexia, seizures, stroke, cerebral edema, delirium, blurred vision, mydriasis

Bath Salts:

Adverse Physical Effects

- **GI:** dehydration, nausea, abdominal pain, liver failure
- **Musculoskeletal:** muscle spasms, arthralgias, rhabdomyolysis
- **Renal:** renal failure
- **Skin:** skin rash, necrotizing fasciitis
- **Other:** fever, dry mouth, tongue disorder, bruxism, tinnitus, increased libido, cold/blue fingers, methemoglobinemia, serotonin toxicity, death.

Laws Banning Bath Salts

- July 2011:
 - Ohio Governor John Kasich signed House Bill 64
 - Legislation took effect on October 17, 2011
 - Specifically possessing or selling MDPV, Mephedrone, Methyldone, 3-FMC, 4-FMC (Flephedrone) and BK-PMMA (Methedrone) are illegal in Ohio
- July 9, 2012:
 - President Barack Obama signed the Synthetic Drug Abuse Prevention Act banning production, sale, and possession of MDPV, Mephedrone, Methyldone, and other synthetic substances

Fass JA, Fass AD, Garcia AS. Synthetic Cathinones(Bath Salts): Legal Status and Patterns of Abuse. The Annals of Pharmacotherapy 2012; 46:436-441.

Gershman JA, Fass AD. Synthetic Cathinones("Bath Salts") Legal and Healthcare Challenges. P & T 2012; 37(10):571-572, 595.

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New Law Bans Bath Salts in Ohio. <http://blog.criminalattorneycolumbus.com/2011/10/24/new-law-bans-bath-salts-in-ohio/>

Bath Salts Management

Sympathomimetic Toxidrome

For all patients: vital signs, cardiac monitoring, peripheral intravenous access, fluid management, temperature control, basic metabolic panel, complete blood count and toxicology screen

For chest pain, shortness of breath or tachycardia obtain: EKG, chest radiograph

Cardiac markers can be drawn judiciously for chest pain

Agitation

Creatine kinases level, benzodiazepines, antipsychotics, antihistamines

Psychotic Symptoms

Antipsychotics

Bath Salts Intoxication: Treatment

- Antipsychotics:
 - Use judiciously due to potential of lowering seizure threshold in patients already at increased risk for seizures
- Modified bilateral ECT:
 - One documented case using ECT for persistent psychosis secondary to repeat MDPV usage

For slides 21-22:

Jerry J, Collins G, Strem D. Synthetic Legal intoxicating drugs: The emerging 'incense' and 'bath salts' phenomenon. *Cleveland Clinic Journal of Medicine* 2012; 79(4): 258-264.

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Penders TM, Gestring R. Hallucinatory Delirium Following MDPV: "Bath Salts." *General Hospital Psychiatry* 2011; 33(5):525-526.

Case Presentation

- Ms. A is a 24 year old female, hx of depression NOS, presenting to the ER with two day hx of severe pain, insomnia, vomiting, HTN, tachycardia, anxiety and infected antecubital wound.

AND

- Mr. J is a 55 year old male, hx of degenerative joint disease status post total R knee arthroplasty, presenting to the ER with severe pain, nausea, tachycardia, HTN and restlessness.

Case Presentation

- What is causing Ms. A's physical symptoms?
 - Answer: IV opioid(heroin) withdrawal
- What is causing Mr. J's physical symptoms?
 - Answer: oral opioid(Ex: oxycodone) withdrawal

What are Opioids?

- **Opiates:** medication derived from opium poppy(morphine, thebaine, codeine)
- **Opioids:** have mu-agonist activity including semi-synthetic & synthetic drugs(fentanyl, methadone, hydrocodone, oxycodone, etc.)
- Used to relieve moderate-severe pain

<http://www.uic.edu/classes/pcol/pcol331/dentalpharmhandouts2006/lecture51.pdf>

<http://www.drugabuse.gov/publications/research-reports/prescription-drugs/opioids/what-are-opioids>

Opioids: US Prevalence

- Approximately 2 million persons abuse or are addicted to opioids (prescription and illicit)
- Nearly 80% received no treatment!

Kraus ML, Alford DP, Kotz MM, Levounis P, Mandell TW, Meyer M, Salsitz EA, Wetterau N, Wayatt SA. Statement of the American Society of Addiction Medicine Consensus Panel on the Use of Buprenorphine in Office-Based Treatment of Opioid Addiction. J Addict Med December 2011. 5(4): 254-263. <http://www.addictioninstitute.org/html/Buprenorphine%20in%20Opioid%20Addiction.pdf>

Opioids: Intoxication Signs

- **Respiratory depression**
- **Miosis(Pinpoint pupils)**
- **Depressed Mental Status**
- Slow pulse
- Low blood pressure
- Low body temperature
- Slurred speech
- Slowed movement
- Head nodding

http://store.samhsa.gov/shin/content//SMA13-4742/Toolkit_Prescribers.pdf

Delos Reyes, Christina. Assessment and Management of Substance-Related Intoxication and Withdrawal. Power point. July 20, 2011.

Opioids: Intoxication Treatment

- **Naloxone(Narcan):**
 - Opioid antagonist
 - Reverses respiratory depression, sedation & hypotension
 - Half life 1 hour
 - Routes: IV(onset action 2 minutes), IM, SC
- **Adult dosage:** Initial dose of 0.04 mg/cc, give 1-2 cc, repeat every 30 sec until response
- **Children dosage:** 0.01 mg/kg I.V., may require repeat 0.1 mg/kg IV

Opioid: Withdrawal Signs

- Pain
- Tachycardia
- Hypertension
- Perspiration
- Yawning
- Insomnia
- Myalgias
- Piloerection (goose bumps)
- Rhinitis
- Abdominal cramps
- Nausea
- Vomiting
- Diarrhea
- Mydriasis (enlarged pupils)
- Lacrimation

http://www.eperc.mcw.edu/EPECRC/FastFactsIndex/ff_095.htm

Opioid: Withdrawal Treatment

- **Short Term Treatment:**

Tramadol(Ultram) 100 mg PO q 6 hr X 48 hours & taper over 4 days

Clonidine 0.1-0.2 mg PO q 6 hours & taper over 4 days

Methadone 20 mg test dose, find adequate 24 hr dose & give q 6 hr, taper 10-20% per day

Delos Reyes, Christina. Assessment and Management of Substance-Related Intoxication and Withdrawal. Power point. July 20, 2011.

Opioid: Withdrawal Supportive Care

- **Pain:**
 - Acetaminophen 650 mg PO q 4hr PRN pain
 - Ibuprofen 600 mg PO q 6hr PRN pain
- **Tachycardia/ Elevated SBP:**
 - Clonidine 0.1 mg PO q 6hr PRN CINA \geq 8.
 - Hold Clonidine for HR<60 or SBP<100
- **Anxiety:**
 - Hydroxyzine Pamoate 25 mg PO QID PRN anxiety
- **Insomnia:**
 - Trazodone 50 mg PO qHS PRN insomnia
 - Diphenhydramine 50 mg PO qHS PRN insomnia

Opioid: Withdrawal Supportive Care

- **GI upset:**

- Dicyclomine 20 mg PO q 6 hr PRN abdominal cramping
- Maalox 30 ml PO q 4H PRN GI upset

- **N/V :**

- Ondansetron(Zofran) 2-4 mg PO/IM/IV PRN N/V
- Promethazine 25 mg PO/IM q 6 hr PRN N/V

- **Diarrhea:**

- Loperamide 2 mg PO q 1hr (max 8 tabs in 24 hr) PRN diarrhea

Opioid: Long-term treatment

- 12 step groups, behavioral therapies
- **Naltrexone:** opioid antagonist
 - Pros:** No addictive/tolerance/withdrawal properties
 - Cons:** cravings, need 2 weeks free opioid period, relapse

Opioid: Long-term treatment

Opioid Replacement Therapy

- **Methadone:** on average 60-120 mg/day PO daily (high doses more effective)
 - Benefits: avoids highs/lows, reduced/stopped IV drug usage, reduced medical risks(HIV, Hepatitis), decreased criminal activity

<http://www.cdc.gov/idu/facts/methadonefin.pdf>

<http://www.drugabuse.gov/international/question-1-methadone-maintenance-treatment-effective-opioid-addiction>

Opioid: Long-term treatment

Opioid Replacement Therapy

- **Buprenorphine(Subutex) :**
 - Induction phase:** abstain use of opioid for 12–24 hr
 - Stabilization phase:** d/c or reduce use of opioid
 - Maintenance phase:** stabilize on a dose of 8 to 24 mg/day, some may require 32 mg
- **Suboxone (buprenorphine and naloxone):**
 - Increased in 2/0.5–4/1 mg per week until stabilization
 - Stable doses of 16/4–24/6 mg
 - May require 32/8 mg daily

[http://www.asam.org/docs/advocacy/asam-consensus-panel-bupe-jam.pdf?sfvrsn=0#search="buprenorphine"](http://www.asam.org/docs/advocacy/asam-consensus-panel-bupe-jam.pdf?sfvrsn=0#search=)

http://buprenorphine.samhsa.gov/Bup_Guidelines.pdf

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